EXHIBIT D

Entities ERD

Microsoft Access - [Relationships]

FW_ENTITY_ATTRIBUTE_VALUE
- ENTITY_ATTRIBUTE_VALUE_ID
- ENTITY_ID
- ENTITY_ATTRIBUTE_ID
- ENTITY_ATTRIBUTE_VALUE

FW_ENTITY_ATTRIBUTE
- ENTITY_ATTRIBUTE_ID
- ENTITY_ATTRIBUTE
- ATTRIBUTE_CAPTION
- CONTROL_TYPE
- ENTITY_ATTRIBUTE_TYPE
- ENTITY_ATTRIBUTE_DEFINED_SIZE
- VALUE_LIST
- RECORD_SOURCE
- COMMENTS

FW_ENTITY_ATTRIBUTE_MAP
- MENU_CONTEXT_ID
- ENTITY_ATTRIBUTE_ID
- REQUIRED
- DEFAULT_VALUE

FW_MENU_CONTEXT
- MENU_CONTEXT_ID
- MENU_CONTEXT

FW_ENTITY_COLUMN
- ENTITY_COLUMN_ID
- ENTITY_ID
- FIELD_NAME
- CONTROL_CAPTION
- CONTROL_TYPE_ID
- DEFAULT_VALUE
- REQUIRED
- TAB_INDEX
- VISIBLE
- COLUMN_FORMAT

FW_ENTITY_RELATION
- RELATION_ID
- ENTITY_ID
- ENTITY_FIELD_NAME
- RELATED_ENTITY_ID
- RELATED_FIELD_NAME
- RELATION_TYPE
- RELATIVE_ORDER
- REQUIRED
- DISPLAY_ON_TAB
- VISIBLE

FW_ENTITY
- ENTITY_ID
- ENTITY_CAPTION
- DATASOURCE_ID
- TABLE_NAME
- UNIQUE_FIELD_NAME
- SHOW_UNIQUE_FIELD
- RECORD_SOURCE
- VISIBLE
- REFERENCE
- ICON
- RELATIVE_ORDER
- DISPLAY_ON_MENU

FW_ENTITY_CONTEXT
- ENTITY_CONTEXT_ID
- ENTITY_ID
- TABLE_JOIN

FW_ENTITY_1
- ENTITY_ID
- ENTITY_CAPTION
- DATASOURCE_ID
- TABLE_NAME
- UNIQUE_FIELD_NAME
- SHOW_UNIQUE_FIELD
- RECORD_SOURCE
- VISIBLE
- REFERENCE
- ICON
- RELATIVE_ORDER
- DISPLAY_ON_MENU

FW_ENTITY_RULE
- ENTITY_RULE_ID
- ENTITY_ID
- RULE_NUMBER
- UPDATE_TYPE
- RULE_TYPE_ID
- RULE_VALUE
- ACTION_TYPE_ID
- ACTION_VALUE
- TRIGGER

FW_RULE_TYPE
- RULE_TYPE_ID
- RULE_TYPE

FW_ACTION_TYPE
- ACTION_TYPE_ID
- ACTION_TYPE

FW_ENTITY_SCRIPT
- ENTITY_SCRIPT_ID
- ENTITY_ID
- EVENT_NAME
- SCRIPT

FW_ENTITY_GROUP
- ENTITY_GROUP_ID
- ENTITY_ID
- GROUP_ID
- MENU_CONTEXT_ID
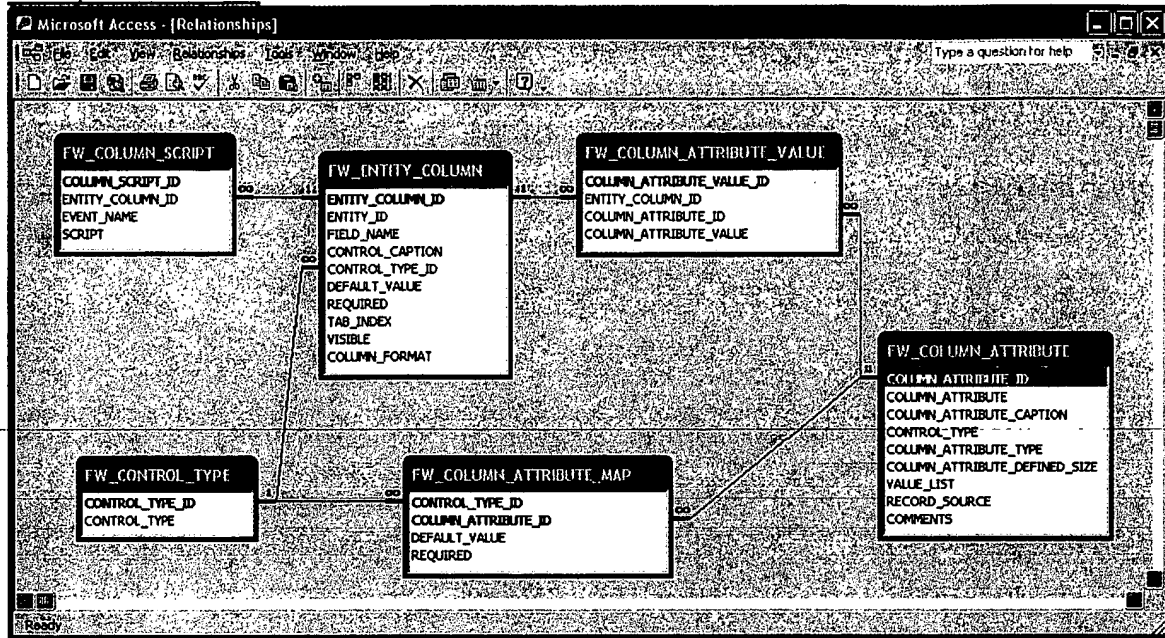
Remarks

During the metadata generation process, the FW_ENTITY table is derived from the underlying tables in the relational database. The FW_ENTITY_ATTRIBUTE table contains a predefined set of attributes that depend on the type of Entity, which is either a Parent Entity or Reference Entity. Depending on the Entity type, a different set of default attribute values are generated and stored in the FW_ENTITY_ATTRIBUTE_VALUE table.

1

EXHIBIT D
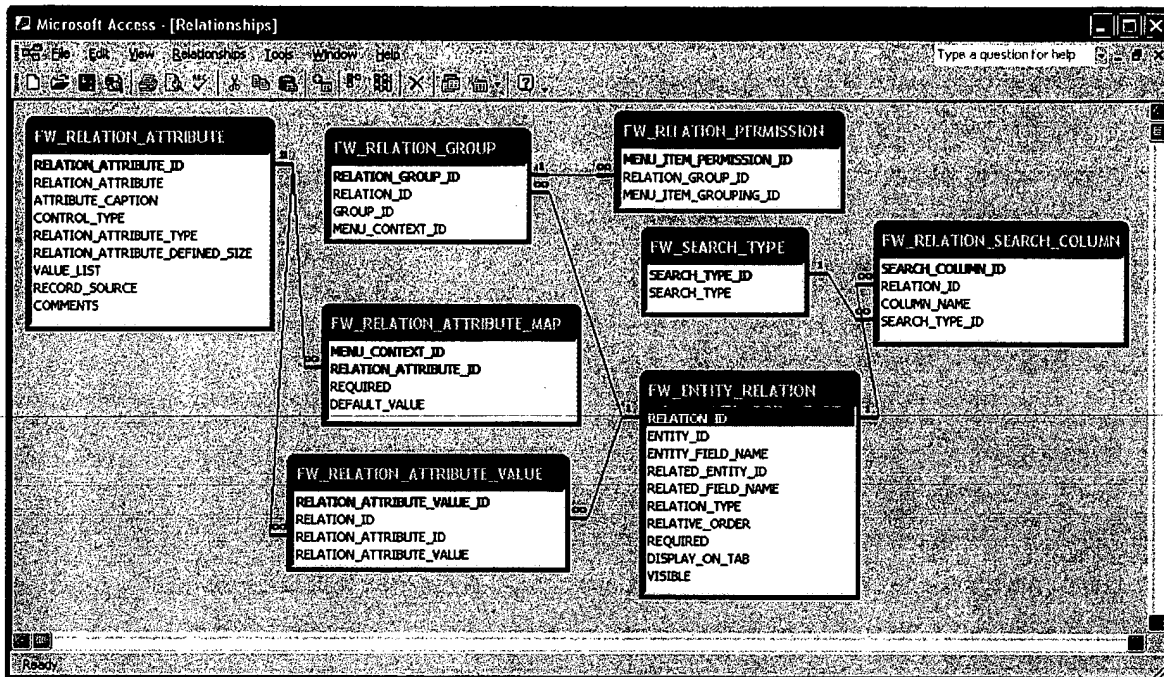
Entity Fields ERD

Remarks

Entity Fields are derived from table columns in the underlying relational database schema. Default data entry controls are assigned to each Field depending on whether the column is a foreign key or, if not, depending on the datatype of the column. Once a data entry control has been assigned, an appropriate set of default attribute values are assigned to populate the FW_COLUMN_ATTRIBUTE_VALUE table with metadata. For example, a combo box control would be assigned a set of attributes (defined in the FW_COLUMN_ATTRIBUTE table) that enable the user interface to generate a drop down list of values at run-time.

EXHIBIT D

Entity Relationships ERD

FW_RELATION_ATTRIBUTE
- RELATION_ATTRIBUTE_ID
- RELATION_ATTRIBUTE
- ATTRIBUTE_CAPTION
- CONTROL_TYPE
- RELATION_ATTRIBUTE_TYPE
- RELATION_ATTRIBUTE_DEFINED_SIZE
- VALUE_LIST
- RECORD_SOURCE
- COMMENTS

FW_RELATION_GROUP
- RELATION_GROUP_ID
- RELATION_ID
- GROUP_ID
- MENU_CONTEXT_ID

FW_RELATION_PERMISSION
- MENU_ITEM_PERMISSION_ID
- RELATION_GROUP_ID
- MENU_ITEM_GROUPING_ID

FW_SEARCH_TYPE
- SEARCH_TYPE_ID
- SEARCH_TYPE

FW_RELATION_SEARCH_COLUMN
- SEARCH_COLUMN_ID
- RELATION_ID
- COLUMN_NAME
- SEARCH_TYPE_ID

FW_RELATION_ATTRIBUTE_MAP
- MENU_CONTEXT_ID
- RELATION_ATTRIBUTE_ID
- REQUIRED
- DEFAULT_VALUE

FW_ENTITY_RELATION
- RELATION_ID
- ENTITY_ID
- ENTITY_FIELD_NAME
- RELATED_ENTITY_ID
- RELATED_FIELD_NAME
- RELATION_TYPE
- RELATIVE_ORDER
- REQUIRED
- DISPLAY_ON_TAB
- VISIBLE

FW_RELATION_ATTRIBUTE_VALUE
- RELATION_ATTRIBUTE_VALUE_ID
- RELATION_ID
- RELATION_ATTRIBUTE_ID
- RELATION_ATTRIBUTE_VALUE

Remarks

Entity Relationships are derived from table foreign key information in the underlying relational database schema. The type of relationship between two tables determines the set of default attributes that are populated in the FW_RELATION_ATTRIBUTE_VALUE metadata table. For each relationship found in the database schema, two entries are made in the FW_ENTITY_RELATION table, one for each side of the relationship (i.e. one-to-many and many-to-one).

3

# EXHIBIT D

Entity Search Path ERD
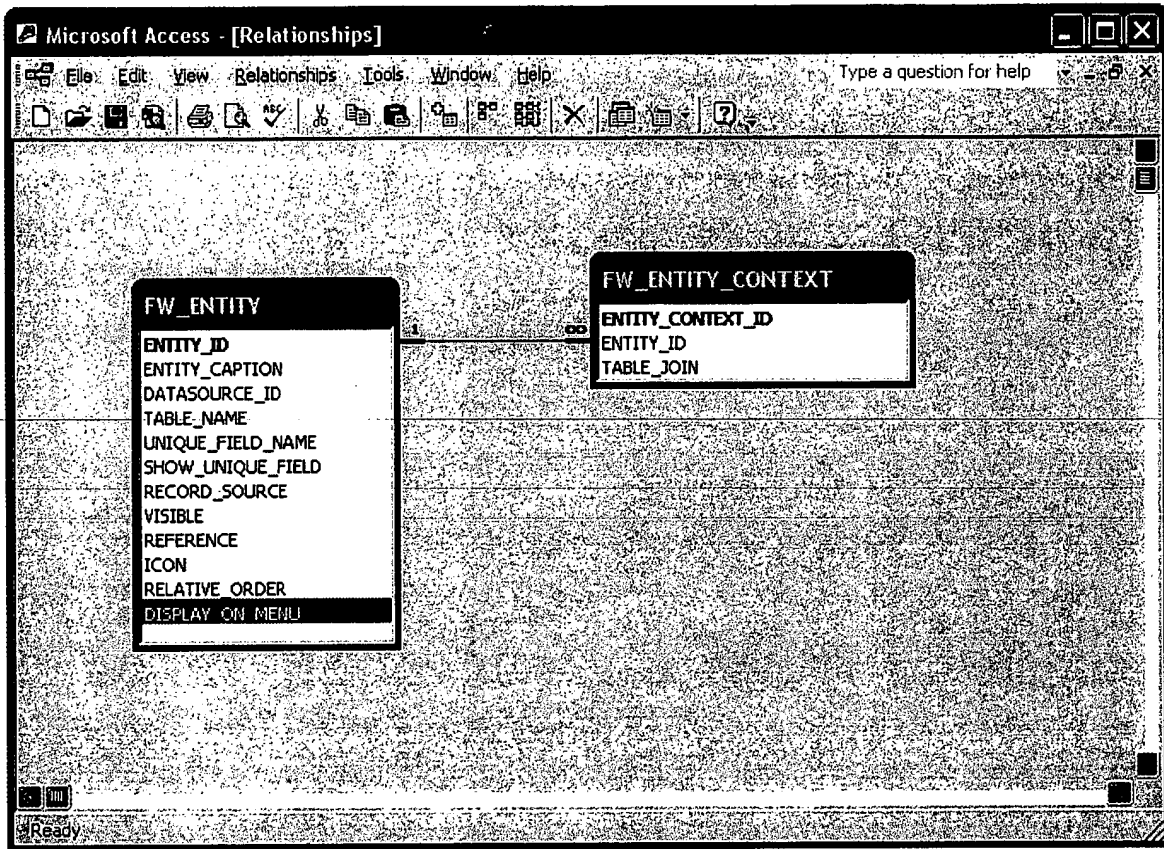
Remarks
To provide Advanced Searching functionality, predefined search paths are stored in the FW_ENTITY_CONTEXT metadata table. During the initial metadata generation process, FW_ENTITY_CONTEXT is populated with table joins that represent all tables directly related to the current entity. Additional joins can be added to a search path through the Utility Tool user interface. The complete set of table joins is then traversed at run-time to provide Advanced Searching functionality.

EXHIBIT D

## Entity and Entity Relationship Permissions ERD
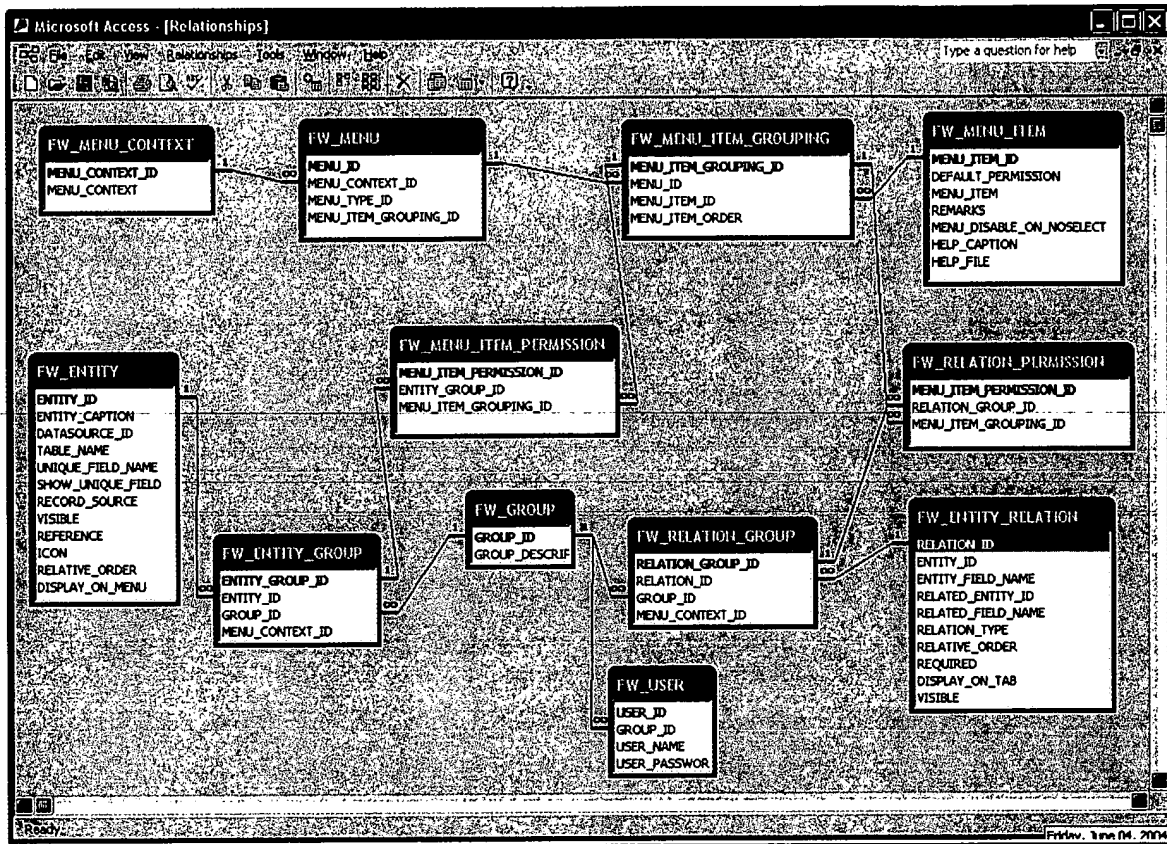
Remarks

As discussed in the patent application, permissions are assigned to context menu options. A different menu context is defined for each type of Entity (i.e. Parent or Reference) and each type of relationship (i.e. One-to-Many, Many-to-One, and Many-to-Many). The possible set of menu options available for each menu context is predefined by the metadata tables with the FW_MENU prefix. During the initial metadata generation process, default permissions are set for the Administrators group. These permissions are set in the FW_MENU_ITEM_PERMISSION (for Entities) and FW_RELATION_PERMISSION (for Entity Relationships). Additional permissions can be assigned to new groups of users through the Utility Tool user interface.

EXHIBIT D

Platform and Platform Attributes ERD
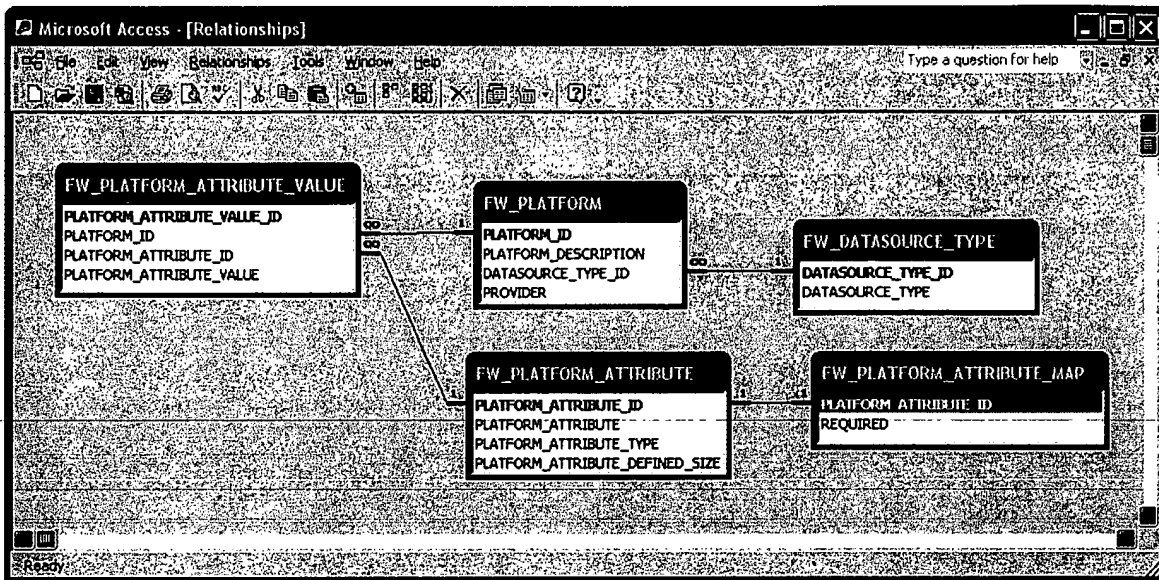
Remarks
The syntactic differences between various database platforms (Microsoft Access, Microsoft SQL Server, Oracle, etc) are predefined in the tables prefixed with FW_PLATFORM. During the metadata generation process, a variety of SQL statements are automatically generated using the FW_PLATFORM tables. This ensures that SQL appropriate to the underlying database platform is generated. At run-time, these same metadata tables facilitate generation of dynamic SQL appropriate to the underlying database platform.